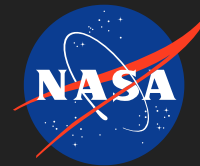


Closed-Loop, Non-Venting Thermal Control for Mars EVA Suits, Phase I

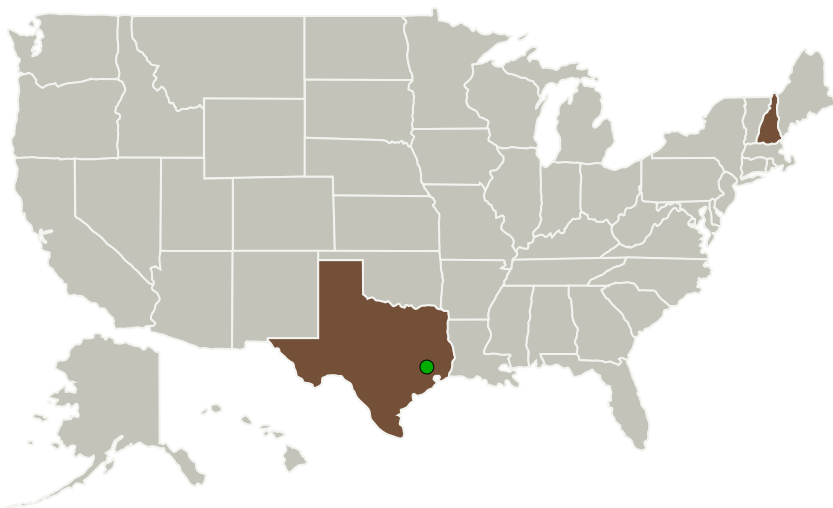
Completed Technology Project (2016 - 2016)




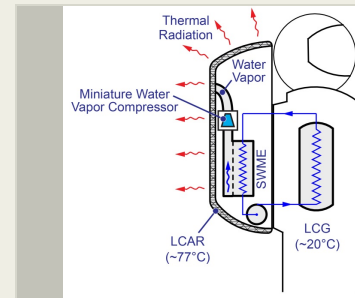
Project Introduction

NASA seeks new thermal control technology for EVA suits on Mars. The system must be closed-loop and non-venting, have negligible impact on the Martian environment, and be capable of operating under Mars surface conditions. We propose to develop a space evaporator/absorber/radiator (SEAR) system with innovative features that will enable operation on Mars. The system uses a regenerable water absorption cooling system that rejects heat entirely by radiation. The key innovation needed for operation on Mars is an enhanced absorption process that enables thermal radiation at increased temperatures. In Phase I we will prove the feasibility of our approach through thermal/fluid/mechanical analysis and assessment of design trade-offs, proof-of-concept experiments, and design of a prototype SEAR for Mars. In Phase II we will build a prototype system and demonstrate its operation under conditions that simulate the Martian surface.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Creare LLC	Lead Organization	Industry	Hanover, New Hampshire
 Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas



Closed-Loop, Non-Venting Thermal Control for Mars EVA Suits, Phase I

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Closed-Loop, Non-Venting Thermal Control for Mars EVA Suits, Phase I

Completed Technology Project (2016 - 2016)



Primary U.S. Work Locations

New Hampshire

Texas

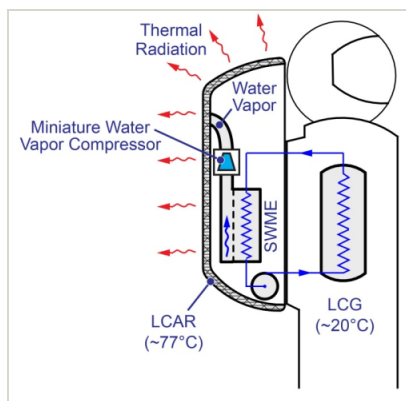
Project Transitions

**June 2016:** Project Start**December 2016:** Closed out

Closeout Documentation:

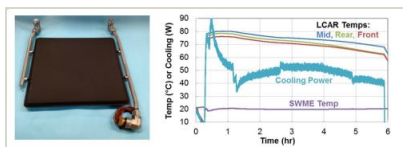
- Final Summary Chart(<https://techport.nasa.gov/file/139570>)

Images



Briefing Chart Image

Closed-Loop, Non-Venting Thermal Control for Mars EVA Suits, Phase I
(<https://techport.nasa.gov/image/129672>)



Final Summary Chart Image

Closed-Loop, Non-Venting Thermal Control for Mars EVA Suits, Phase I
Project Image
(<https://techport.nasa.gov/image/134196>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Creare LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

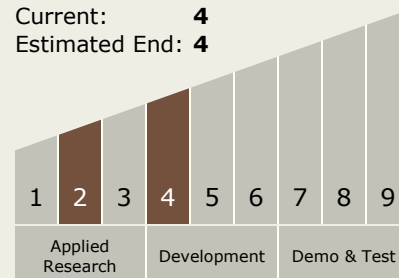
Carlos Torrez

Principal Investigator:

Michael G Izenson

Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4



Closed-Loop, Non-Venting Thermal Control for Mars EVA Suits, Phase I

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Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.2 Thermal Control Components and Systems
 - └ TX14.2.3 Heat Rejection and Storage

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System